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THE COVER: Harriet Linton, Research Director, is shown in a symbolic setting, surrounded by the tools of the trade. Top to bottom: Key Punch, which records information on cards; Sorting and Tabulating Machine, which counts and sorts cards; and Computing Machine, for figuring percentages and correlations.

Officers of the Intercollegiate Broadcasting System:

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Heavy Promotion Marks Fall Preems

Promotion for fall broadcasts hit a new high this year, with Columbia's WKCR, WYBC at Yale, WVBR at Cornell, Princeton's WPRU, WES of Wesleyan, and WSRN Swarthmore hitting on new schemes and going all-out to capture listener interest and attract staff members.

The Columbia campus station, newly-renamed WKCR, is hitting on all six with a big première broadcast and attendant publicity. The broadcast was purposely delayed several days after the start of the semester, to let the overflow of students at the University become acquainted with the station, and to allow time for a good publicity job.

WKCR's program, TOUCHDOWN, was presented on October 3, and oriented towards the Columbia-Navy game which took place the following Saturday. TOUCHDOWN was an original variety show, written by a staff headed by Arline Newfield, and produced by Tak Kako, WKCR's Program Manager.

TOUCHDOWN was presented to a capacity audience at Columbia's MacMillan Theater. Special engraved invitations were issued to Columbia faculty and administrative officers, alumni and friends of the station, and the IBS New York office staff. The remainder of the audience was attracted by posters distributed all over the Columbia campus. The program featured four attractive and talented girl singers, a crooner, and a fifteen piece band. The story of the program followed the football theme, with musical selections highlighting the comedy. Special emphasis was put on the station's new call letters, to insure proper future identification.

Up in Ithaca, WVBR Cornell is using a continuing promotion campaign to attract listeners to the station and to acquaint old

students with the station's newly changed call letters. Promotion plans have been on the fire all summer under the direction of Joel Chaseman and Anatole Browde. All members of the WVBR staff are wearing lapel buttons (like political campaign buttons) with the station's call letters and frequency displayed. In addition, the station is distributing blotters, with the call letters in bright red colors, two inches high, to some 5000 students on the campus.

The blotters were chosen because they are a comparatively permanent reminder of the station. During the first week of school, a fifteen by three foot banner of canvas, painted on both sides, will be stretched between two campus buildings, telling of the new call letters.

The staff of WYBC, Yale, decided on a spectacular stunt to attract the attention of the student audience. In the first week of school, they hired a cow from a local farmer. Heelers (tryouts for staff jobs) in the Public Relations Department prepared two large banners for Bossie's back: one read MOOSIC FOR YOUR LISTENING PLEASURE, and the other WYBC HAS THE CREAM IN MOOSIC. Staff members paraded the cow around the campus for several days, and report that a large amount of interest was aroused by their stunt.

Through the years Princeton has found its most effective means of getting an audience and a staff in the coincident running of feature stories about WPRU, ads for staff members, and program schedules in the campus paper. This highly effective campaign was renewed this year, with gratifying results.

(continued on page 12)

How To Choose Announcers

by Mackie Quave

The Program Manager of the usual standard broadcast station is lucky if he has a half dozen men on his announcing staff. The average number is four and they are called on to perform every announcing chore. A standard station, operating on a limited budget, must use a few announcers who can switch personalities, who are "Chameleons of the mike."

The jolly lad who calls forth the late sleepers at eight in the morning, may also attempt to be the dignified, formal emcee on the "Patio Concert" at tea time. The newscaster who reads bulletins in a crisp, staccato manner, is also the rich-voiced "poet" whose pear-shaped tones waft the bobby-soxer and dowager away to pleasant dreams on "The Music of Words."

While the ability of an announcer to "double" must not be played down, the use of a variety of voices and personalities perfectly suited to the program type will increase the audience and create greater interest in the station. The campus station has the advantage of an entire student community from which to choose its voices. The Program Manager should make every effort to get the best.

Arrange a personal chat with the aspiring announcer. Note his natural voice, and compare it with his microphone voice, which should be free from affectation. Choose cosmopolitan speakers whose accents are equally pleasing to Pennsylvanians and Carolinians, Californians and Minnesotans. Make a distinction between those with good diction and overprecise enunciation. Listen carefully for slurred vowels and omitted consonants. Insist on faultless pronunciation. Eliminate provincial voices and those that are brittle and nasal. Welcome resonant tones, but beware of over-resonance. Voices like the latter soon become boring and tiresome. An adept Program Manager can recognize good material in less

than a minute. Beware the lad who has "a little radio work" on the local station. He may have acquired a number of bad reading habits. If his voice is good, it pains to correct his faults.

Always listen to auditions—never read them. Sometimes a handsome profile beams a deadpan voice. You may be influenced by appearance alone. Have your operator play the audition to you in a location where you may hear the applicant as the average listener would hear him, or listen in the control room without watching the tryout.

Announcers may be broken down into the following general classifications: News, Commercial, Sport, Special Events, Popular Disc Jockeys, Classical DJs, and Interviewers. Prepare audition material that will be suited to each division, with due regard to the specialities of your station.

News auditions should be prepared from today's news. Don't use material that came from the printer last week or a month ago. A news reader should have good pacing. He must not rush through the first two pages of material, slow to a snail's pace on the third, and pick up speed on the fourth. He should know the correct pronunciation of places and proper names, enunciate them distinctly and without hesitation. He will allow a brief pause between bulletins, and phrase properly to convey understanding.

The commercial announcer should be given a variety of announcements. Include a time signal, an institutional and spot announcement, the local department store, and several pieces of copy calling in turn for purchase and enthusiasm, straight from the shoulder. Talk to the masculine audience, and a wife's ful appeal to the distaff side. Note the commercial announcer's selling power. When he says, "Smith's Lotion makes hands soft and smooth," do you want to buy a vial tonight? Is your first thought when next you

ening your tobacco pouch "a Lord Fauntleroy Pipe that filters the bite" out of 10¢ tobacco? If your answer is "yes!" place that man on your staff immediately.

The commercial man should have perfect control over inflection and interpretation. He should be bright and sparkling when his copy indicates; smooth, subtle and deliberate when required. Watch that his delivery is not sing-song, nor overenthusiastic.

A sports announcer should be auditioned by sending him to a sports event and listening to his on-the-spot account. A good man will call plays as fast or faster than the spectators can follow them. If he lags, so that you catch the crowd reaction thru the speaker before he tells what happened, cross him off your list. His play-by-play account should be rapid, clear, and accurate. Voice does not matter particularly if he knows his sports but he should never be used on other shows. Fine sportscasting calls for much study of the game, the teams and their players. It's a full time job.

Ask the Special Events man to describe ad-lib, without notes, a recent campus event which he witnessed. His description should be so vivid and clear that you are immediately transported to the scene. His account must be replete with colorful adjectives and verbs to make a continuously shifting picture, focussing on the highlights and sidelights for complete human interest. Better still, let him do an audition of an actual campus happening.

The Popular Disc Jockey should know his records and artists from A to Z. His record shows should be well-prepared with terse, tangy continuities about the current doings of the current favorites and tidbits about tunes. He must never bore his listeners with elaborate introductions to "Stardust," "Night and Day," "Begin the Beguine," and the like. But he should constantly call attention to selections that have the promise of becoming hits.

Unlike the popular disc jockey, the classical announcer does not usually prepare his own copy. But he should be conversant with numerous composers and works. Perfect pronunciation of their names is a must. Audition material for the CDJ should be filled with musical terms - adagio, scherzo, allegro; "L'Arlesienne Suite," "Tod und Verklarung," and "La Gioconda." And composers like Verdi, Wagner, Debussy,

and Prokofieff. The CDJs' delivery and style should be formal but unaffected, and at a pace we'll call "lento."

Finally, interviewers should be versatile - interested in people, places, and things. The interviewer should try to place himself on the same plane as the person being interviewed. An opera star would prefer being called "Miss," "Mr." or "Madame," while a pop singer will be better known to her public by her first name. The interviewer should be equally at ease with a full-length script or a few hastily scribbled notes. Celebrities' visits are usually whirlwind affairs, leaving little time for preparation. Give your applicant a prepared script for the first interview and a few notes for the second. Then, compare the two. While the latter may not be a finished performance, it should possess spontaneity, humor, and a chatty, friendly air.

Women announcers, while not common in standard stations, are popular with many campus broadcasters. They can be extremely good, but extra care is required in choosing them. Those with deep, resonant voices appear to be most acceptable to listeners.

Mr. Program Manager, take time to pick your staff. You'll reap rewards in the campus "Hooper."

MACKIE QUAVE

Mackie Quave, author of this article, is chief announcer for station WKIX, Columbia, South Carolina. He is an instructor in English at the University of South Carolina, teaching courses in radio; he is faculty advisor for IBS station WUSC.

He became interested in campus radio when he read Eric Barnouw's Saturday Evening Post article in 1941, and resolved to start a campus station if he ever had a chance; he made the resolution good when he started teaching radio at the University of South Carolina.

KTX STAFF MEMBER GOES TO LSU

Lucille Ruby, faculty Program Manager of the campus station at Stephens College last year, will be studying at Louisiana State University this fall.

Preparing Classical Music Schedules

by Alan Rich

In the recent IBS survey it was proved again that classical music, in intelligent and competent presentation, is one of the program types most preferred by college students. There are many reasons for this; perhaps the most arresting is that so little of this sort of radio fare is available on most local commercial outlets. This is a sad circumstance which we need not go into at this time, but it becomes increasingly obvious that the campus station has an unparalleled opportunity for useful service to its audience, although they admittedly represent a minority of the public as a whole.

In drawing up a monthly or a term's schedule of classical music, important considerations must be kept in mind. Musical tastes cover a wide and varied range; no two persons are in complete agreement on their favorite symphony, composer, or mode of composition. It behooves the classical music director of a station to subjugate his own likes and dislikes to a decided degree in preparing his schedules. The number of people who listen to classical music, or at least "hear" classical music, is far greater than the number of music students or serious musicians at the college. There should be room for both the Art of the Fugue and the Grand Canyon Suite on a music schedule.

The well planned hour of music should have both unity and contrast. It is impossible to have "something for everybody" on every program presented, but some attempt should be made in this direction. There may be people who are fanatically devoted to Mozart Piano Concerti and who would lap up a program offering three of them; but a program which offered a single Mozart Concerto, a Beethoven Overture, and, say, the Brahms Haydn Variations would claim the attention

of the Mozartians and a lot more listeners besides. I don't disapprove of programs built around a single idea if the program can make musical sense, but I have seen the idea overdone too often. At WHCN we had a long standing controversy over the value of devoting, say, every Monday night (for an hour, of course) to Beethoven's music, every Wednesday to Mozart, Thursday to modern music, and so forth. I discontinued the system for the following reasons: first, I felt that the Beethoven fanatics who had Monday night classes (wartime acceleration, you know) were being short-changed; secondly, it was not always easy to put together well-balanced programs of Beethoven week after week; and finally I felt that spreading a little more Beethoven around through the week would make others of our programs more attractive.

But of course in seeking contrast within a given program it's all to easy to achieve something else. Continuing with Beethoven, merely as an example: I would hesitate to juxtapose one of the late quartets with the Tchaikowsky 1812 Overture. The two works are contrasted all right, but they just don't complement one another. Very well, you say, what would I put with the C#Minor Quartet? Perhaps a short Mozart Quartet or even something like the Shostakovich Quartet; if you don't want an hour of chamber music, how about a 17th Century Orchestral Suite - Corelli, Telemann, etc. - or a Bach Brandenburg Concerto or a Handel Concerto Grosso, or even better the Vaughn-Williams Fantasia on a Theme by Tallis? When the major work on the program runs to 50 of the 60 minutes, it's probably better to fill the time with another piece by the same composer or by a near contemporary. All-Beethoven programs are good occasionally, as are all-Mozart, all-Brahms, be-

cause we find among the output of any of these composers music of a variety of moods, forms, and mediums. All-Rimsky-Korsakoff programs, or all-Roy Harris or all Faure programs, I'd say, are not so good, for just the reverse of the above reason.

Now, the station manager will find himself beset constantly by the connoisseur element in the student body; they will clamor for more Gregorian Chant or more Schönberg. They should be listened to, of course, and they should be heeded. A radio station can be quite instrumental in presenting the sort of music that even the most devout music-lover just never hears in concert halls. The record companies have made many admirable recordings of this unfamiliar but significant music, and they should be heard. But it is all too easy to become "rarity mad." There can be a program devoted to collector's items if the records are available, but there's no sense in playing a scratchy, ancient recording of a work because it happens to have historical values which overshadow its musical values. But as concerns out of the way music for which there are good recordings available, fairly discreet handling should prevail. The average student browsing the kilocycles and coming across Schönberg's "Pierrot Lunaire" will usually attribute the sounds to a faulty tube; but if the station can make a point of announcing well in advance that it will air a special broadcast of Schönberg's "highly significant and controversial 'Pierrot Lunaire,'" it can probably attract a fair proportion of the listening audience to what would otherwise be a bitter pill.

The music bill of fare that is going to satisfy the widest variety of musical appetites must contain a carefully arranged balance of all material that comes under the general heading of serious music. There must be a healthy representation of the so-called "standard" compositions. Beethoven's Fifth Symphony may be a bore to the musical "sophisticate," but the symphony still continues to win new admirers day after day. It must also be remembered that very few students are willing to make time during the weekday evening hours to give the radio their full attention: many students leave their radio on as merely a background to reading, studying, or the bull session. Music should be chosen with an eye to its suitability as "Music to Read By."

Vocal music requires more attention and in general is more obtrusive than instrumental music. Therefore the station should go easy on vocal music during the hours when most students are hitting the books in earnest - later in the evening, after ten o'clock. Similarly, music with slashing rhythms and dissonances will generally receive a more attentive reception earlier in the evening. The emphasis in the late hours should be on music which is fairly familiar, consonant, and which can make itself felt in a general "lift" of the atmosphere in the student's room even with the volume tuned down.

A final word - no matter how the "intellectuals" will yell at the music policy of a station, you will find that there are plenty of students who will fail to criticize the policy just because it's good. With a realization of his own shortcomings as regards musical prejudices and with an attentive ear toward the likes and dislikes of his listeners, the alert classical music director can be eminently successful in fulfilling one of college radio's greatest services.

MARVIN STOCKING HEADS UCBS

Staff members of UCBS, IBS Trial station at the University of Connecticut, recently elected Marvin Stocking '48 as Station Manager for the current year. At the same time, Edward Kluck, Walter Knox, and James Campbell were appointed temporary program coordinators. UCBS' Business Manager is Edward Arcelaschi; Doris Bonney is Advertising Manager; and Don Davidson, Chief Engineer. Other positions on the Executive Board will be filled in the near future.

The Husky Network is busily expanding its facilities to cover the South Campus, where several hundred veterans are being housed. Equipment is being constructed to enable the staff to carry remote broadcasts of away athletic events.

UCBS has not yet set the date for the start of broadcasting. They hope to have all construction work completed before going on the air. Intensive personnel recruitment is currently going on, and administrative departments are being established.

RECORD REVIEWS

by Joel Chaseman (WVBR)

It's in this corner each month that you'll find a column or two about the newest phonograph records. The purpose of our column is to give you a fair idea of the worth of each disc, both technically and from a programming standpoint. We will review the records and grade them, not on their value as musical experiments or their relation to 'the real jazz,' but on how we think they will go over with a college audience. This does not mean that we will subordinate ordinary good taste to a shopkeeper's sense of 'what will sell.' We shall merely try to be fair to all crowd-pleasers, whether Guy Lombardo or Eddie Condon. We will arbitrarily divide the music into four categories - Hot, Sweet, Vocal, and Novelty. We will try grading each number roughly: ***for tops, **good, *fair, and ?? why was it released....

With that out of the way, let's look at the output for the past month—

HOT

Woody Herman: Blowin' Up a Storm**
Fan It**

These are in the modern Herman manner, wild, unrestrained, but without his usual rockbound rhythm section. The brass is sharp, Bill Harris' trombone inspired. Fan It is the Woodchoppers with Norvo and a Woody Herman vocal. (Columbia: 37059)

Les Brown: High on a Windy Trumpet**
Lover's Leap**

This is a great band and getting greater. This coupling departs slightly from Brown's usual dance sides. It is controlled all the way, however, with no crazy man blowing his top on trumpet screechings. (Columbia: 37061)

Billy Butterfield: The Sharp Scarf**
Rumors are Flying**

Butterfield seems to be on a small sized James kick, especially with 'Rumors.' Beat is fine, singing acceptable. (Capitol: 282)

Capitol Jazzmen: You Can Depend on Me**
Stormy Weather**

This great group includes Moore and Cole from the King Cole Trio, Benny Carter, and Coleman Hawkins. Kay Starr sings flipover and does a workmanlike job with her heavy voice and blues feeling. (Capitol: 283)

*****Errol Garner Album:** Solos wonderful piano, tasteful and inventive. Surfaces not so good. (Mercury A-10)

***Ike Quebec Tenor Sax Album:** O.K. for jazzmen, questionable for average audience. Quebec and men are fine. (Blue Note A-102)

SWEET

Larry Clinton: Solitude*
Stormy Weather**

A capable job by an experienced leader. It is smooth, has a good beat, a fair vocal group on 'Weather.' (Solitude is all band, and not as good as Duke Ellington's old record). (Cosmo: 482)

Claude Thornhill: Smiles**

Night and Day**

These are pre-war. Thornhill's new band is good, possibly better, but these are fine for dancing or listening. They won't wake anybody up. (Columbia: 37055)

Skinnay Ennis: Got a Date With an Angel**
I Don't Know Why*

Don't give up on Angel - the first few bars may scare you, but it gets there! I Don't Know Why seems to know enough. Ennis is a menace!! (Signature: 15033)

VOCAL

Jo Stafford: Apple Blossom Time*
This is Always*

Miss Stafford is acclaimed by musicians, but we personally can't see it. Her voice is rather irritating; but beat and phrasing wonderful. An all-star instrumental group backs her on these. This is Always is an important song. (Capitol: 277)

Frank Sinatra: One Love**

Somewhere in the Night**
Both very sincere with really intimate

feeling. These will be very popular, and deservedly so. (Columbia: 37054)

Margaret Whiting: Along With Me*

When You Make Love to Me**

This girl is really getting up there! You should be establishing a Whiting file, because she'll be rating it soon. These are fine, but only fair for her. (Capitol: 269)

Josh White: Blackwater Blues*
Jelly, Jelly**

Intense singing by a real musician. The man is right beside you, instead of behind a loudspeaker. (Decca: 23582)

NOVELTY

Louis Jordan: Choo Choo Ch' Boogie***

That Chick's Too Young to Fry**

Right in the Jordan groove. A worthy successor to Caldonia, Stone Cold Dead in The Market. He is amusing, full of rhythm, 'Chick' is quite easily understood double entendre.

Spike Jones: Glow Worm, Hawaiian War Chant, I Dream of Brownie with the Light Blue Jeans, Jones Polka, That Old Black Magic, Liebestraum.

***for the batch! These are wonderful for anyone who can stand Jones at all. He goes all out with what must be a warehouse full of effects. (Victor 20-1893/5)

Data Digest—

HOT

Jerry Wald: Diga Diga Doo*
Rhumba Fantasy* (Sonora)

Shorty Sherock: Snafu**
The Willies** (Signature)

Louis Prima: Brooklyn Boogie??
My Valentine* (Majestic)

Charlie Ventura: S'Wonderful**
Nobody Knows the Trouble
I've Seen** (Black&White)

Tembo Jazz Men: When I Grow Too Old To*
Moose the Mooche* (with Diz
Gillespie, C. Parker) (Tempo)

Harry James: Why Does it Get Late So Early?**
Beaumont Ride* (Columbia)

SWEET

Harry James: And Then It's Heaven**

I Guess I Expected Too Much**

I've Never Forgotten**

This is Always** (Columbia)

Lombardo: I'd Be Lost Without You*

On the Alamo?? (Decca)

George Olsen: Somewhere in the Night??
Which Way'd They Go?*
(Majestic)

Tony Pastor: Willow Road**

Under the Willow Tree** (Cosmo)

George Paxton: This is Always**

Along With Me** (Majestic)

VOCAL

Ken Carson: Pin Marin**

It Seems Like Ages* (Cosmo)

Johnny Mercer: My Sugar is So Refined**

Ugly Chile** (Capitol)

Andrews Sisters: I Don't Know Why*

Azusa* (Decca)

King Cole Trio: You Call It Madness**
Oh But I Do* (Capitol)

Herb Jeffries: I'm Just a Lucky So-and-So*

I Left My heart in Miss-
issippi** (Exclusive)

Bing Crosby w. Jascha Heifetz: Lullaby**
Where My Caravan Has Rested***
(Decca)

Andrews Sisters w. Les Paul: Them That Has,
Gets*

Rumors Are Flying** (Decca)

NOVELTY

Judy Canova: My Fickle Eye*

Apple on a Stick* (ARA)

Jerry Colonna: My Fickle Eye**

A Farmer's Life is a Very
Merry Life* (Capitol)

NOTICES

The last issue of the Bulletin saw the inauguration of a Notices column, for advertising for equipment and information. Space is free to member stations and IBS personnel; copy should be submitted to the IBS office by the 16th of the month preceding publication. Notices serve as a useful method of telling about new ideas, such as record companies, exchanging equipment and transcriptions, and so forth. Use of copy is limited by the extent of space, and subject to editor's discretion.

Does College Change People?

It is always interesting to speculate on the effects of a college education upon the student. If college really changes people, there should be marked differences between Freshmen and Sophomores, differences that cannot be accounted for by age. The IBS Campus Listenership Survey, for which nation-wide returns are now being tabulated, indicates that changes in radio program preferences do take place between the different years of college.

These changes, discovered in analysis of the returns of 1445 questionnaires from 15 colleges (the final survey report will include about 1950 returns from 20 colleges), show a consistent pattern of what might be termed increasing "cultural level." The significant changes are summarized in the following tables. The figures indicate the percentages in each group expressing a preference for the various program types.

PREFERENCES INCREASING DURING COLLEGE

	Fr.	So.	Jr.	Sr.	Incr.
Symphonic music	72%	74%	73%	85%	+13%
Semi-classical	86	84	86	92	6
Opera, operatic	44	45	44	51	7
Folk music, ballads	37	39	34	45	8
Round tables, etc.	33	30	34	42	9
Talks, interviews	17	18	22	24	7

PREFERENCES DECREASING DURING COLLEGE

					Decr.
Dance, popular music	89	85	87	81	-8
Hot Jazz, Blues	54	50	48	41	-13
Sports events	54	49	48	40	-14
Sports comment	36	34	31	21	-15
Variety, comedy	77	70	66	61	-16
Quiz programs	37	30	33	25	-12
Mystery plays	53	48	43	44	-9
Other radio plays	62	56	52	55	-7

There are several possible explanations for these changes. One explanation would be on the basis of "selection." That is, it could be argued that the type of student who likes certain types of programs would be somewhat more likely to leave college than the type of student who likes other types of programs. For example, if the student who likes discussion programs is more likely to remain in college than the student who likes variety and comedy programs, then the senior class might be expected to contain a larger proportion of people liking discussion programs than the freshman class, and a correspondingly smaller proportion of people who like variety and comedy shows. An explanation of this sort argues, of course, that there is no real change in the people themselves, but that the senior class differs from the same class in its freshman year class only because the composition of the group has changed.

It seems likely, however, that this is not the only reason, although it may play a part. One thing that can be seen from the tables given above is that in many cases, the difference between juniors and seniors is as great as, or greater than, the difference between freshmen and sophomores, and between sophomores and juniors. Since people who drop out of college tend to do it in their first or second years, changes resulting only from selection should be consistently greater in the first two years, and negligible in the last two years. Our figures do not show this, so there must be some change in the people themselves, as well as a change in the make-up of the group.

Dissatisfaction with radio

Another difference found among the various college classes is in their dissatisfaction

faction with the radio programming they are now getting. This is found by asking whether there are any types of programs they want broadcast more than they are now. College students are much more likely to express such dissatisfaction than people on lower educational levels, with 62% of our sample requesting at least one program type. We have found that there is no difference at all among the first three classes in the proportion who are dissatisfied, 60% occurring in each of the first three classes. In the senior class, however, 75% express this dissatisfaction. (The fact that this difference occurs only between junior and senior classes tends to indicate that the change is not due to selection, as discussed above).

It is only in music that differences emerge between the type of program requested by one class and the next. Of those in each class who express a desire, 75% want more music. While both popular and semi-classical music decline, in terms of those asking for these types of music, symphonic music increases, which would seem to indicate that the desire for symphonic music develops as a "pure taste," independent of preferences for other kinds of music. More popular music is desired by 15% of the freshmen, and 7% of the seniors; more semi-classical music by 26% of the freshmen and 16% of the seniors, while the requests for more symphonic music increase from 27% to 48% between first and last years of college.

WKCR DIRECTOR SELLS SCRIPT TO

COLUMBIA WORKSHOP

Ernest Kinoy, director-member of the WKCR Director's Guild, has sold two scripts to CBS's Workshop. Scripts are adaptations of Herman Melville's "Moby Dick" and will be presented on the Workshop October 19th and 26th. Kinoy is a free-lance writer who has sold material for several national shows.

MUSIC HALL AGAIN AVAILABLE

The IBS Music Hall series is again available for use on IBS Member stations. The 13 weeks series is built around symphonic recordings readily available to the stations. A post-card to the IBS New York Office will bring the series to any station.

WKCR Serves

In Crisis

WKCR, Columbia University campus station, continued its long record of public service to the campus when all the maintenance employees of the University called a strike October 10. With janitors, maids, power plant workers, and others out, campus life rapidly approached the point of paralysis.

WKCR promptly planned a round-table with representatives of the union and the University discussing the terms demanded by the union. The program on the night of Oct. 10 at the start of evening's broadcast, featured a statement on the situation by the university, and a talk by William Grogan, vice-president of the Transport Workers Union, to which the striking university employees belong. The program concluded with notices regulating campus life in the crisis, listing hours at which elevators would operate (elevators are a necessity in Columbia's 14-story dorms), and requesting the students to "take it easy" in consumption of hot water and electricity.

GOVERNING COUNCIL MEETING

The October Governing Council meeting will be held in New York on Saturday, October 26, and Sunday, October 27. All Member stations are represented on the Council.

ANNOUNCERS HANDBOOK NEARS COMPLETION

The IBS Announcers Handbook, which will be released on November first, is now going through its final revision. Authored by Page Boyer, former Manager of KTX Stephens, and Mackie Quave, Faculty Advisor for WUSC at the University of South Carolina, the handbook gives tips to station announcers on operating procedures, methods of reading announcements, and other basic factors in station announcing.

Covering Temporary

Housing Units

At many colleges and universities the large influx of returning servicemen, many of them married, has resulted in an acute housing shortage. To overcome this shortage at many colleges temporary housing units are being erected, usually to house the married students and their families. Quonset huts, trailers and small pre-fabricated dwellings are being installed on available empty property. In many cases the only such available areas are little-used playing fields, and vacant lots that are removed by a considerable distance from the campus proper. Probably an extreme example can be found at Harvard where accommodations for 400 families have been obtained by renovating barracks at Fort Devon. A bus will be operated between the fort and the Harvard campus.

Such temporary housing units, when they are at some distance from the campus, will not lie within the coverage area of the campus station. Their remote position also means that students living in them will feel detached from many of the aspects of college life, and in many cases will have more time to listen to the radio. It is important for the campus station to cover such communities, to help integrate them into campus life and to maintain service for all of the college community.

Technically, the problem of bringing a campus station to a remote living area is not difficult. The major obstacle is more likely to be the operating expense, since a leased wire is usually required. If the campus station cannot afford this expense, a subsidy by the university, or payments by the students who will be benefited, may provide the funds.

The most practical arrangement for coverage of a temporary housing unit is to install a small transmitter at the housing site and feed the program to it over an

audio line leased from the telephone company. It is generally not difficult to make the signal from a small transmitter located near a group of temporary dwellings heard in each dwelling. A study of the a-c wiring in the dwellings will probably reveal that the power to all of them is over a common 115/230 volt circuit isolated from other similar circuits by a distribution transformer. All that need be done in this case is to feed the r.f. from a small transmitter into the 115/230 volt circuit. The a-c wiring will carry the signal into all the buildings on the circuit.

Perhaps several circuits will be found which should be energized. If this is true, an r.f. line can be erected to permit feeding power in an appropriate point on each 115/230 volt a-c circuit.

A "broadcast program loop" (Schedule I in most locations) must be rented from the local telephone company to feed the small transmitter. This line should be driven by a small audio amplifier rated .25 watts at .5 percent R.M.S. distortion into 600 ohms through a 600 ohm 6db "H" type isolating pad. (If a push-pull cathode follower amplifier is used the 6 db pad may be omitted and the power output requirements reduced to .060 watts). Push-pull 6J5's with a 20,000 ohm to 600 ohm output transformer will do. Push-pull 6J6's (each 6J6 connected to act as a single tube) will deliver adequate power as cathode followers.

The small transmitter probably should not be rated over 5 watts input to the modulated Class C r.f. Amplifier. A 6SK7 crystal oscillator driving a 6J6 final r.f. amplifier and modulated by a 6J5 driving a 6F6 makes a good line-up. A 6SJ7 buffer stage should be added if the 6SK7 is operated self-excited. The cost either way is nearly the same, and the crystal results in a much more reliable oscillator.

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The transmitter should be designed for continuous operation since it is better to leave it running all the time instead of working out an expensive remote control scheme to turn it off and on. As a matter of fact, there is evidence for the view that less wear is caused to tubes by continuous operation than by intermittent operation because of the even temperature at which they are maintained.

The equipment usually required is as follows:

- 1 Telephone Line-driving amplifier rated 0.25 w. at $\frac{1}{2}\%$ distortion into 600 ohm 6 db H isolating pad.
- 1 6 db H pad.
- 1 Broadcast program loop (phone line).
- 1 Transmitter rated 5 watts input to final r.f. stage.
- 1 or more R.f. coupling devices to couple transmitter to a-c line.
- 1 R.f. lines system at remote point, if required.

Detailed circuits and further instructions on the above equipment can be obtained by writing the IBS Technical Manager. The station files may contain the following references which will be of help when designing such an installation:

The Best Ways to Increase a Station's Coverage: IBS Bulletin, Dec. 1945, p. 7

Limited Area Radio Broadcasting Using Small Transmitters: IBS Technical Memorandum #8, February 18, 1946

IBS Technical Data Book references:

- Telephone Lines pp. TI 3022-25
- R.F. Coupling pp. TI 3034-36
- Frequency Control pp. TI 1101-08
- Design of Plate Modulated Class C R. F. Amplifier: IBS Technical Memorandum #6, February 13, 1946

Transmitter Frequency Stability Considerations: IBS Bulletin, March 1946, p. T 1
Additional copies of these publications are available on request.

THIS WEEK STORY ON IBS

This Week, Sunday supplement of 7,500,000 circulation, carried a story on the operation and organization of campus stations in the September 29 issue. Piece highlights amusing incidents in station operation, is illustrated with pictures of WSRN, Swarthmore. Copies are being distributed to member stations.

WYBC Broadcasts

Hersey's Hiroshima

Station WYBC, at Yale, will feature transcribed broadcasts of John Hersey's "Hiroshima" at 9:30 on four successive nights, beginning October 8. The transcriptions, taken from ABC network broadcasts of Sept. 18 through 21, were obtained from Robert Saudek, ABC's Director of Public Service, by "Speed" Johnson, WYBC's Program Manager.

Each program is one half-hour long, representing the condensation of one-quarter of Hersey's story. The programs are restrained in production, depending only on the voices of the actors and the dramatic impact of Hersey's words for their effect. The programs were produced without any sound effects or background music, or even a narrator. Each actor reads the portion of the story relating to one of the people involved.

"Hiroshima" first appeared in the August 31st issue of the New Yorker, when the entire editorial content (all space except the ads and theater notices) was devoted to Hersey's 30,000 word narrative. Reprint rights for the story have been sold to a number of newspapers throughout the country, who are publishing it in full. A New York publisher, Alfred A. Knopf, is bringing the story out in book form the first of November. The Book-of-the-Month Club is distributing these copies of "Hiroshima" free to all its 750,000 members. Penguin Books (a 25¢ series) is also planning to issue the story in November. The New Yorker announced that all proceeds from reprint and broadcast rights are being given to charity.

WYBC scheduled the program at the station's peak listening period, according to "Speed" Johnson, because "this is one program that everybody should hear." The broadcast dates were arranged to avoid conflicting with a New Haven newspaper, which recently carried the entire narrative.

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TEXAS COLLEGE OF MINES BUILDING CAMPUS
STATION

Ten Accept Board Positions

Notification of election to the Board of Directors, as ordered by the Governing Council at the May meeting, has been carried out during the summer months. According to instructions, Dave Linton has seen most of those who came out in the top nine; the announcement of their acceptance was made early in September.

At present, the members of the Board are:

Judith C. Waller, head of the Public Service Department of NBC's Central Division (Chicago), co-Director of the NBC-Northwestern Summer Radio Institute, and author of "Radio, the Fifth Estate."

Dr. R. R. Lowdermilk, Educational Radio Specialist of the U.S. Office of Education.

Morris S. Novik, Public Service Consultant and former City Commissioner in charge of New York City station WNYC.

Robert B. Hudson, CBS Director of Education and former head of the Rocky Mountain Radio Council.

Roger Clipp, Manager of WFIL, Philadelphia and long-time friend of IBS.

Guy della Cioppa, Assistant to the President of CBS.

Russell Potter, director of radio activities at Columbia University.

The three IBS executives on the Board are Dave Borst, Technical Manager, George Abraham, Chairman, and Dave Linton, Program Manager.

Announcement of the filling of the two other Board positions will be made shortly, after the people elected to them have been notified.

TULLERS ARE PARENTS

Bill Tuller, of the IBS Technical Advisory Committee and his wife Kay had a daughter, Kathryn Lindsay, on October 1st.

Virgil Hicks, Extension Director of El Paso station KTSM, in charge of radio instruction at the Texas College of Mines, wrote recently to say that much progress has been made in the construction of a campus station at that college. Transmission tests have been carried out recently; the transmitter, operating on 700 kc, is equipped with meters for all kinds of readings.

The station's controls have two studio mike inputs; one control room mike input; two turntables; air-check monitor; headphones; and audition or broadcast facilities. Both studio and control room are sound conditioned with Celotex. The group hopes to have another studio in the near future.

The radio department at the Texas College of Mines is jointly sponsored by the school and station KTSM; the station supplies the instructors and knowhow for the department. A permanent line is maintained from the campus station to KTSM; the campus station can feed KTSM and the NBC net, or the campus station can re-broadcast KTSM or NBC shows with permission.

CURC PUBLICIZED IN PARADE.

Parade, Sunday supplement distributed to some 4,000,000 people, carried a picture story on the operation of WKCR, Columbia, (then known as CURC) in the August 11 issue. Copies were sent to the heads of all member stations.

(continued from page 1)

Station WES, Wesleyan, has supplemented newspaper promotion with posters announcing the hours of operation and frequency of the station. Paid ads in the campus paper were oriented to recruit a staff from the large number of new veteran students.

WSRN, Swarthmore, is distributing weekly music program schedules, listing all the selections for that period. Distribution of musical schedules has long been found the most effective means of promotion among lovers of fine music, a group prominent on most college campuses.

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WORDS ON RADIO

PLEASE SEND ME ABSOLUTELY FREE, by
Arkady Leokum

Publishers, like movie producers, know when they have a ready-made market for a certain type of book, and they make haste to capitalize on it. THE HUCKSTERS and THE BIG NOISE, published almost simultaneously, pointed out the hollowness and psychological ills which beset many in radio and advertising professions; now another publisher has presented PLEASE SEND ME ABSOLUTELY FREE, by Arkady Leokum (an ad-man who still has his job) using the same theme.

PLEASE SEND ME ABSOLUTELY FREE could almost be THE HUCKSTERS in its methods of pillorying the evils that beset the advertising field, and in the complete cynicism displayed by most of the characters. It is, however, a far better novel, with all its parts more clearly integrated and its minor characters given a chance to develop; failures in the lives of the characters do not occur only because of grasping materialism, but also because of personality weaknesses.

Gene Winter, the leading character, is a serious-minded college student hoping to become a great writer when he meets a man-hungry school teacher at a summer hotel. He quickly accepts an offer of her apartment and support. Soon he withdraws from the liaison, and gets a job in a small and not-too-successful agency after a series of fantastic and amusing ruses. His progress as an advertising copywriter is rapid, broken by his marriage to a home-loving girl and a bout with novel-writing on a Connecticut farm, until he gets the job in a Hucksterish agency for a soap account. His final break with the advertising business is caused by his wife's tragic death, a discussion with his college English professor, and his realization of the ruthlessness of his boss, who refuses to be harsh

on the enemy because he hopes to do business with them after the war.

Gene Winter is not a sympathetic character, for his urge to be successful and failure to maintain the values he started with too thoroughly suppress his fine qualities until the amazing change at the end. Only when with a woman does he approach kindness and tenderness, and then only for his own ends; his selfishness is too thoroughly ground into him to enable him to be pleasant. Freida, his wife, is sympathetic because of the manner she maintains her belief in the good values of life; however, this sympathy is blunted by the knowledge that she cannot comprehend the values that rule her husband's world, and so cannot understand him. The rest of the cast—a selfish and lonely schoolteacher; Gene's early bosses without enough drive for success; Professor Wurden, incapable of influencing Gene—lack the personality factors to turn the events of the story to good ends. They are all too lost in their search for personal satisfactions to really understand the other humans who come into their orbit. The characters almost uniformly fill one with a sense of anger at their selfishness, if not a sense of frustration at their failure to see and enforce the good values of life. All have moments when their characters seem redeemed; all are so bogged down by their inability to live beneath the surface of life to be sympathetic, even though their personalities are quite understandable.

REX ROBINSON GOES TO UTAH

Rex Robinson, formerly faculty advisor for WBRG, Bucknell, has gone to Utah State Agricultural College at Logan, Utah, where he will be Assistant Professor of Speech. He writes that the college has a small radio layout for instruction, and does programs over a local station. He hopes to get official permission to establish a campus station at the college.

FRANKL NEW WHCN BUSINESS MANAGER

Ken Frankl has been elected Business Manager for the Crimson Network (WHCN) for the coming year. Last year he supervised the IBS survey at Harvard.

Campus Broadcasting Begins 10th Year

WBRU STARTS TENTH YEAR OF BROADCASTING

WBRU, at Brown University, the pioneer campus radio station, started its tenth year of broadcasting on October 10th. This year the station has a heavier schedule than ever, to be climaxed the last week of November with the station's formal celebration of the tenth anniversary.

The program schedule of WBRU, according to Bernie Frechtman, Program Manager, has ten and one-quarter hours of broadcasts each day. Early risers on the campus will be greeted by "A.M. Mayhem," a platter-chatter opus on the air from 7:30 to 8:45 daily. From one to six every afternoon the station will broadcast uninterrupted music, ending with the rebroadcast of "Tea Dansant" from a local FM station. Evening broadcasts, with a predominance of live shows, are between 6:30 and 11:30. Among the features this term are the Brown Table Discussion, Pembroke Party Line, and twice weekly campus news broadcasts. The last hour and a half each evening is devoted to a classical music show, Music to Study By. The IBS Music Hall is prominently featured in the WBRU schedule.

An open house October 2 brought more than a hundred new recruits for the station staff; all departments are now staffed for full operation. Temporary appointments have been made for some executive board positions, pending elections later in the semester. These include Joe Palastak as President; Larry Chedester, acting Station Manager; and Frank Williams, acting Advertising Manager. Walt Neiman, who has just returned to WBRU from the Army, is in

charge of all arrangements and the broadcast for the anniversary celebration.

The station plans to use the entire week of November 25 through 30 to celebrate ten full years of broadcasting to the Brown campus. Present plans include a half-hour broadcast (station hopes to have this sent over a regional net as well as to the campus), with a history of the station and a sketch of its operating methods, climaxed by interviews with the founders, George Abraham and David Borst. Celebration during the week will center on on-campus promotion. The station hopes to have a reunion of all WBRU alumni on the weekend of November 30-December 1, with a banquet get-together followed by the broadcast. It is believed that over half the former staff members will attend this celebration of the tenth birthday of the first campus radio station. WBRU is cooperating fully with the Brown administration in plans and arrangements for publicity.

WMAC BECOMES

FULL MEMBER

The twenty-second full Member of IBS, station WMAC at MacMurray College (Jacksonville, Illinois) joined the System on September 27, coincident with the start of their fall broadcasting. The station, operated by an all-student staff, many of them trained in radio courses, is under the general supervision of Howard C. Hansen, Professor of Speech. Prof. Hansen has supervised the growth of the station ever since it became a Trial group in the summer of 1944.

The student staff, operating the station two hours a day, is headed by Chuckie Hext, the Station Manager. Other members of

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WMAC's operating staff include Mary John, Chief Engineer; Ardis Kresensky, Script Chief; Lois Ingels, Chief Announcer and Business Manager; Marion Rucci, Music Director; and Dorothy Loer, Head of News.

WMAC has one studio with a control room. The control room has a Gates consolette; there are four RCA Junior Velocity microphones. A line runs from WMAC to WLDS, the local standard station. Cooperation between the two stations is close, with Mac-Murray broadcasting variety and musical shows over WLDS regularly. Reciprocating, WLDS furnished the engineer who did the station installation and sound-conditioning of the studios.

WMAC is on the air from 6:45 to 7:00 each morning, and 5:00 to 5:30 and 10 to 10:45 every evening, Monday through Friday. The present program schedule is predominantly musical, with the IBS Music Hall a feature presentation. Other musical programs are built from the RCA-Victor record service, and piano recitals utilizing the station's own baby grand.

Here's a hearty welcome to WMAC!

UCRS PLANS FOR RETURNING VETERANS ON STAFF

Jim Oglesby, UCRS Station Manager, and Paul Yergin, former UCRS president, working with the station staff, have prepared and sent a welcoming letter and description of the plans for the facilities and programs for the station for this year, to all veteran staff members who are returning to college.

Completed drafts of the letter, which told about the station's new quarters, the procedure that would be followed at the opening of school, and plans for returning to the air, the radio script course and plan for co-operation with Skidmore students on dramatic shows, were sent at the end of August. The letters were accompanied by a postcard questionnaire, asking what position the recipient formerly had on the staff, and if he was interested in returning to WMAC. Paul Yergin's summary of past events at the station and the plan for expansion

of the station facilities in new quarters was enclosed. The report also outlined the results of the IBS survey at Union, and suggested the way these results would be used in the station's programming for the coming year.

The letter was first planned late last spring, when the UCRS staff realized that the expansion plans for the station and program changes suggested by the survey results, would require a large and trained staff for successful operation. In some cases, the station had heard from former staff members who were returning as veterans, inquiring what the station was doing and what jobs might be available when they did return.

A meeting of returning UCRS staff members was held during the first week of college. The work accomplished during the summer was discussed, and further work planned. A discussion of programs and plans were made; the staff was organized to prepare the schedule, recruit and train new staff members, and operate the station until the trainees are equipped to take over. Returning veteran staff members were placed on the staff before new members are recruited.

An executive committee meeting was held on September 16. Prof. B. G. Robbins, who will teach radio, was introduced to the station executives, and Bob Brooks was made acting President. It was decided to broadcast from 7 to midnight, starting Sept. 23. Construction of a studio and control room, master control, and announcing booth is to be started immediately.

STEPHENS CALL LETTERS CHANGED

Word recently came from Stephens College that the station's call letters would be changed to KWVC this fall. Station was formerly known as KTX.

WBRU GOSSIP BY EDITOR'S DAUGHTER

A short story in "The Lyons Den," New York Post gossip column, reports that the gossip program on WBRU is being done by Barbara Squire Adler, daughter of General Julius Ochs Adler, New York Times vice-president and general manager.

Moylan, Penna.
Labor Day

Letters to THE Editor

This month we are starting a regular column of Letters to the Editor. All readers are asked to contribute their comments on the material, including debates on opinions voiced in the various articles.

* * * * *
Denver, Colorado
August 28, 1946

Dear Sunny,

I just read the Bulletin. Congrats to you and the entire staff. The format and the material were very readable and enjoyable. Being me, I'll probably have some gripe or other by the time I get to NY, but in any event, the present edition was a big step in the right direction.

Tak Kako

New York, N. Y.
August 26, 1946

Dear Miss Brown:

I've just received a copy of the IBS Bulletin, and wanted to tell you right away what a wonderful job I think you've done with it. As you may remember, I was once editor, and feel, therefore, more than a casual interest in the publication.

The format, use of type, and general production quality are really outstanding. And such a contrast to the little mimeographed opus I can remember so well.

If the Bulletin is a reflection of how IBS has grown since I was associated with the organization, then it certainly has made tremendous strides. I hope you'll accept my congratulations and very best wishes.

Sincerely,
Naomi Ross Fine

Dear Sunny and Dave,

Congratulations on the Summer edition of the Bulletin! I don't know how often you can put out such a complete edition, but it looks terrific. The building up of regular features, plus personal boosts, such as the Mademoiselle award thing, look like the right track to me. Publication plans sound promising. What I feel many station managers and workers don't realize is that membership declines are their own fault; College radio has to be sold to the students, both for active and passive participation - because it is better than something else, a lot of somethings else - and for clear-cut, black and white reasons. Can you collect information from the various stations regarding what they have done to sell their stations and programs to the students as listeners and prospective members, and ask them for a discussion of the problems they have in that regard? Collect all the data for a Bulletin article, or a pamphlet or something, and offer it as a promotional aid to harassed station executives.

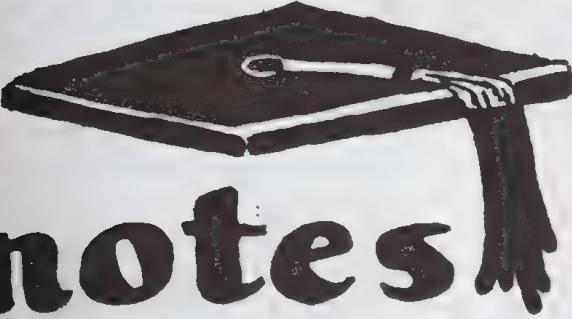
Did the survey bring out any clear distinction as to whether the programs rating highest in listening appeal were so high by their own merits, or merely because it was the only program of the station that the listener liked at all? In other words, how much cataloguing was done of listener suggestions for programs or ballot writings? If there was a considerable response on this point, let's have an article in a forthcoming Bulletin discussing "What Your Listeners Want to Hear" or some such title. Probably you have already planned this; it seems one of the most important things a survey could bring out.

Can't make up my mind about the Technical articles belonging in the Bulletin. I suppose they do, but I confess I wasn't able to finish reading any of them. I presume interested Technical people will have no trouble.

From this safe distance it's wicked to say Keep Up the Good Work, but it really does answer the question "Of what use is IBS to us?"

Regards,
Bill Sullivan

alumni



notes

Don Stix, Swarthmore '41 is now working as a transmitter engineer for WEAF, out at Port Washington, L. I. He dropped in to the New York office recently and told about his work; he's on the 1 to 9:00 AM shift, doing maintenance work and keeping check when the station is on the air.

Jim Robinson, Princeton '43, Trustee and faculty advisor for WPRU, has returned from his trip to Operation Crossroads.

Cam Williams, Bryn Mawr '43 recently wrote expressing her interest in the Alumni Association and pledged her membership for several years.

Marie Bransfield, Wellesley '46 and former president of WBS, is now working on a radio station in Washington, D.C. The name of the station is unavailable at present.

Jean Williams, of WSRN, is now a copy writer for N. W. Ayer, New York ad agency.

Herb Barlow, Brown '45 and formerly WBRU President, has returned from Navy service; he's studying law in Washington, preparing to become a patent attorney.

Don Burnside, Brown '46, Technical Manager and President of WBRU, has returned to Brown. He was recently married.

Powell Ensign, Brown '38 and worker on the early network, is back at his job in the NBC Information Department.

Bill Wise, former CURC president, is now working in the CBS news room.

Ruth Clayton, formerly Publicity Director of BRN, has left Pic magazine to work for B. Ellis and Associates, a radio production firm.

Judith Chalmers, formerly on Cornell's WVBR, is now traffic manager for station WWDC, in Washington, D. C.

Bob Currie, former head of WXPN at the University of Pennsylvania, is now instructing English at the University of Delaware. He says he'll have a station there as soon as possible.

Myron Curry, Brown '41 and former president of WBRU, has been promoted to continuity director of station KMBC, Kansas City. He has been an announcer on the station since his return from Army service.

James Lyddy, Union '46, is now a graduate student of radio broadcasting and speech at Columbia University. He is an announcer on the WKCR staff.

HAMILTON SURVIVES SUMMER,

PLANS FOR FALL

Facing a depleted staff and enrollment of only 250, WHC rallied behind a successful advertising campaign to launch its summer schedule of broadcasts. The IBS outlet at Hamilton College, Clinton, N. Y., bucked technical difficulties and wound up ready for fall business with prospects for a staff of 33 or more, a more stable broadcasting rig, and an advertising goal of \$1000. WHC plans a nominal compensation for its executives as a personnel incentive and 10% for all local contracts signed. The station takes to the air on October 14, probably at 640 kc. A tie-in with WIBX, a Utica standard station, calls for airing college choir, forums, and dramatic presentations. Hamilton's grid games are on the Saturday broadcast agenda, plus continuation of a popular Sunday series of four hour request concerts. If the advertising picture brightens, new studio equipment is in the offing.

Achieving Audio Fidelity

The Need for Good Audio Fidelity

The advent of frequency modulation with its inherent ability to transmit the entire audible spectrum with low distortion and minimum background noise has caused an increased interest in transmitting high fidelity signals on the AM broadcast band as well. As AM-FM console combination receivers begin to make their appearance on the campus replacing some of the present poor quality AM table models, the great difference in the audio quality of the programs transmitted on the two bands will become apparent. The only answer as far as a campus broadcasting station is concerned, is to make the audio fidelity of its signal as good as possible. In this way it can approach, but never equal, the fidelity of the FM system.

Frequency Response Requirements

The IBS Technical Code requires that a campus station's frequency response "after microphone or phonograph pickups (be) flat within plus or minus 2 db. of the 400 or 1000 cycle response from 100 to 5000 cycles per second." As are most of the Code requirements, this is a minimum requirement. A similar flatness of response between 70 and 7000 cycles is better. If the requirement of plus or minus 2 db can be met over the range of 50 to 10,000 cycles, this station will approach the response of an FM system. FM systems must cover the range of 50 to 15,000 cycles.

Distortion Requirements

Referring again to the IBS Technical Code, the limit for distortion is given as "distortion introduced after microphone or phonograph input: less than 7.5% r.m.s. at 95% modulation measured at 1000 or 400

cycles per second." Compare this with the following schedule of maximum distortion permitted an FM station at 25%, 50%, and 100% modulation:

Modulation Frequency	R.M.S. Distortion
50 to 100 cycles	3.5%
100 to 7,500 cycles	2.5%
7,500 to 15,000 cycles	3.0%

Distortion of the low order required in FM broadcasting can be achieved by careful design of each amplifier unit.

Peak Level Distortion.

When discussing distortion it is important to remember that a program circuit must be able to handle sudden peaks without overloading. Generally it is agreed that these peaks may be as much as 10 db. (10 times the power) above the signal level as read by a standard VU volume indicating meter. For this reason steady-state checks on distortion should be conducted on audio amplifiers at a level 10 db. greater than the normal peak level they will carry when in use. Similarly, transmitters should be adjusted so that 100% modulation comes at 10 db. above normal peak level, so as to be sure overmodulation on peaks does not introduce distortion.

Inter-modulation Distortion

Inter-modulation distortion has only recently been given much study by designers. In systems having low harmonic distortion at all audio frequencies, the inter-modulation distortion caused when two frequencies are passed simultaneously will also be low. If, however, system distortion is measured only in the middle audio range, there is considerable danger that distortion may be high at the extremes of the audio range. The result is that such a system will exhibit a large percentage

of intermodulation distortion when passing a complex audio wave composed of high and low frequency components. Intermodulation distortion is more annoying than harmonic distortion, since the intermodulation distortion products are not any integral multiple of the original frequencies. Special instruments are available to permit testing for inter-modulation distortion and if less than 2% is present when measured by these instruments, the audio system is a good one. If r.m.s. distortion measurements are made over the entire audio pass band, and found to be low throughout, then inter-modulation distortion will also be low and special tests are not necessary.

Noise and Hum Level Requirements

On this subject the IBS Technical Code reads: "Noise and hum introduced after microphone 40 db. or more below 95% modulation signal. Unless extremes of shielding and plate supply filtering, and careful location of equipment are resorted to, it will be difficult to achieve a hum and noise level comparable to that required of FM. On the other hand the background noise on the AM band will prevent the listener from getting the low hum and noise performance possible with FM even if the AM station is capable of it. So a practical compromise must be reached, which probably is a hum and noise level of 50 db. below 100% modulation.

Important Audio Circuit Design Principles

It is the misfortune of college broadcasters that they must compete for an audience which would otherwise be listening to stations whose capital investment is reckoned in thousands of dollars rather than in the tens or hundred of dollars available for college projects. Yet the fact that audio quality of campus stations is usually good enough for students to want to listen to them for many hours is a tribute to the ability and ingenuity of student station designers.

To help every station designer find ways to further improve the quality of his station's signal, the following design principles are listed:

1. Terminate microphones in their rated load. For instance, crystal microphones require a load resistance of several megohms in order to give good low frequency response.

2. Properly equalize phono pickups, to agree with their characteristics and the type of recording being played. Recommended circuits and values, or complete equalizers, are available from the pickup manufacturer. A different set of equalizer values is required for 33 1/3 r.p.m. transcriptions in place of those used for 78rpm shellac pressings.

3. Use resistance-capacity coupled stages wherever possible, since good transformers which will not introduce attenuation at certain frequencies and distortion due to saturation are very expensive. Values for resistance-capacity coupled stages are given in the rear of the RCA Receiving Tube Manual. Modify these values to make f_1 at least as low as 50 cycles; be sure to select pentode stage values so that f_2 is not less than 10,000 cycles. When several stages are being cascaded, consider the over-all response of the unit as well as the response of each stage. Avoid cascading high gain triode stages; use low gain triodes or pentodes instead.

4. Use a cathode follower in place of an output transformer in medium-level stages whenever possible.

5. Use negative (inverse) feedback to improve frequency response and reduce distortion. Negative feedback may only be used over stages having a fixed gain relationship, such as in a microphone preamplifier, or in a modulator. Also, in transmitter design, a portion of the r.f. output may be rectified and applied to the input terminals of the modulator to get an effective way of obtaining low transmitter distortion. In stages where no other means is possible, leaving off the cathode by-pass capacitor will provide a useful form of inverse feedback. This type of feedback is present in the cathode follower.

6. Design amplifier equipment to have low distortion at a power level 10 times the normal peak level (peak as read on a VU meter). This rule does not apply to modulators; they need only produce a low level distortion signal at the power level required for 100 per cent modulation. This level is one half the combined power input to the plate and screen circuits of the modulated stage.

Testing Methods

A good quality amplifier and loudspeaker can be used to check audio fidelity quickly if the operator is experienced in

recognizing good quality. For this reason, every station should use such an amplifier for monitoring, and it is advantageous to have the monitor arranged with a switch which will connect it at different points in the program path (this "roving" monitor is especially important in Master Control installations).

When using the monitor to test for quality, the comparison method may be used. A good quality audio signal should be obtained; this may be from an FM receiver or good quality phonograph pickup. First the signal should be fed into the monitor amplifier directly, and then through the unit under test (with the required adjustment in volume). Any noticeable difference in quality should be investigated. If necessary, feed the signal into the final stage of the unit under test, disconnecting the previous stages, and then repeat including in the circuit each previous stage until the offending stage is located.

In addition to listening for distortion and impaired frequency response during the above tests, noise and hum should be noted. Of course, the hum level of the monitor itself should be low. Any noticeable increase in hum should be corrected.

When testing a transmitter by the comparison method, test first the modulator to be sure it is not causing distortion. When the modulator quality is acceptable, connect the monitor to a diode detector and couple this loosely to the r.f. output of the transmitter. In this way it is possible to test the quality of the r.f. signal as it is heard on the air.

More precise distortion and frequency response tests are possible using an audio oscillator and an oscilloscope. Apply a sine wave to the input of the audio circuit under test and observe the output waveform on the oscilloscope screen. There should be no visible departure from the sine wave. If the input wave is placed on the vertical plate of the 'scope and the output wave placed on the horizontal plates, a straight diagonal line, ellipse, or circle will be produced on the screen. Distortion will appear as a curve on the ends of this line. Distortion of about 2% will be just visible by this process.

Precise measurements of the magnitude and type of distortion can be made with a Wave Analyser, a complex tuned voltmeter which will measure the signal present at the fundamental and each of the distortion frequencies.

In using sensitive instruments, particularly those with high input impedances, it is essential to eliminate hum pickup in the test leads. Shielded leads should be used and common ground established between the instrument and the unit under test.

Noise and hum tests can be performed using oscilloscope as a voltmeter and increasing gain enough to permit measuring low voltages.

The performance of the transmitter may also be checked by arranging the cathode ray oscillograph to display the familiar trapezoidal pattern at 100% modulation. This method is described in detail on pages 130-131 of the 1946 ARRL Radio Amateur's Handbook.

None of these test methods permit measuring percentage of distortion; to do this easily and accurately more expensive equipment, such as a distortion and noise meter, or a wave analyser, is required. If one of these instruments is available, it should be used, as it will give quick results and valuable information. The dangers which attend making distortion tests at a single frequency should be borne in mind, however, and tests should be run at several frequencies.

Conclusion

The IBS Technical Code give the minimum audio fidelity required of a campus station. Increasingly better audio fidelity will be needed as console type AM-FM receivers appear on the campus in increased numbers. The station designer will find he has less money and inferior test equipment at his disposal than have designers at standard AM stations and FM stations, and so he will have to employ ingenuity and diligence to achieve the desired results.

Fortunately, inexpensive circuits can be made to perform well if certain basic design principles are followed. A number of these design principles are given in this article. Also, once units have been constructed, they must be tested to determine how well they meet the desired performance standards.

A good quality amplifier-speaker combination together with an FM receiver can be used to make comparison tests which will reveal performance deficiencies on a qualitative basis. The same results can be achieved more rapidly and precisely if an audio oscillator and cathode ray oscillo-

graph are used to make sine wave tests on audio amplifiers, and trapezoidal modulation tests on transmitters. This test equipment should be more readily available than expensive distortion meters and wave analysers.

References:

IBS Technical Code...IBS printed form T146 FM Standards of Good Engineering Practice (FCC)...FM and Television, Oct. 1945, p.28
The Radio Amateur's Handbook, 1946...a book published by ARRL.

CBS Studio Control-Console and Control Room Design: IRE Waves and Electrons, May, 1946
Page 287

RCA Receiving Tube Manual...a book, RCA Technical Series, RC-14

A Note on the Power Ratings of Audio Amplifiers: IBS Bulletin, Summer 1946, p.22

Intermodulation Distortion...IBS Bulletin, Summer 1946, p. 19

SUGGESTIONS FOR THE SELECTION AND USE OF PHONOGRAPH

PICKUPS AND TURNTABLES

1. Selection

A. Choose a pickup with a low inertia element. Low inertia makes for good tracking and high quality response. Some types which have been recommended are: Western Electric 9A and Fairchild 542, among the dynamic types. Of the crystal pickups, the Brush PL-20 is one of the most satisfactory.

The pickup should have low needle pressure. This prolongs the lifetime of both needle and records. Those listed above meet this requirement.

The arm should not be too heavy, i.e., it should not have too much inertia either for its swinging motion or its up-and-down motion. Excessive inertia causes poor tracking and extra record wear, as well as audio distortion.

B. The turntable must be quiet and vibrationless and must remain so after prolonged use. It must also maintain constant speed, without the slightest variation, either during a single revolution, or over a long-

er period of time. Some satisfactory tables are: Fairchild 524, Presto 10A, Rekotut D 16. Less suitable substitutes are the better quality ones of the Garrard and Green Flyer tables.

2. Mounting

A. Mount the pickup arm so that the tip of the needle passes over the proper point on the turntable. This is generally specified by the manufacturer. Failure to place the arm properly will cause distortion in the audio output and undue record and needle wear.

Mount the arm at the proper level, i.e., so that it is exactly horizontal when resting on the transcription or record.

Mount the arm so that it swings in a horizontal plane. This can be checked by clamping the vertical motion and letting the arm swing freely. If it does not remain in any position it is set in, the mounting is not right.

B. The turntable must be mounted so that it is exactly horizontal. This must be checked with a good (sensitive) spirit level.

3. Condition

When first installed and at reasonable intervals, the following items should be checked carefully:

A. The motion of the pickup arm must not be stiff. It must swing freely on both axes, but must not wobble in its bearings.

B. The turntable must be checked for proper speed (with stroboscope) and for any indication of "wow." "Wow" can generally be detected by listening to a recording of a long sustained note in the middle audio range.

C. The needle should be replaced frequently. Steel needles, if used, are not good for more than a few records, and only one 15 minute transcription. "Permanent" needles are good for only a few months of broadcasting, and should be replaced regularly. Crystal cartridges are subject to damage by mechanical shock or heat, and replacements should be kept on hand. The crystal cartridge of the Brush PL-20 is equipped with a permanent jewel stylus which is particularly subject to damage. However, the manufacturer operates an inexpensive repair service, making the use of this unit economical. Replacement crystals should always be kept on hand.

UNIT CONSTRUCTION OF STATION EQUIPMENT

Reasons for unit design

When building broadcast equipment it is advantageous to design it as a number of small units. Some of the advantages in doing this are:

- 1) Increased reliability of station because it is often possible to remove a defective unit and operate temporarily without it.
- 2) Easier servicing of equipment because trouble may be easily traced to defective unit. This saves time in locating faulty circuits and finding proper remedy for the trouble.
- 3) Station facilities may be expanded with a minimum of disturbance to existing equipment, since generally only circuits interconnecting the various units need be re-arranged as units are added.
- 4) Improved units may be substituted for obsolete ones without disturbing the rest of the equipment. This permits making intelligent modernization plans.
- 5) Units no longer needed for their original intended application may be used for some other application after a few modifications.

Selecting Appropriate Units

In general, each unit should perform a specific function. However, one or two functions may be combined in one unit when the number of parts required for each function is small. Thus, a large transmitter would logically be divided into r.f. oscillator and amplifiers on one chassis, the modulator on a second chassis, and the power supply on a third. However, a very small transmitter would be built complete on one chassis, since otherwise the investment in chassis, connectors and so forth would be almost as much as the cost of the other parts needed for each unit. A good guide is to consider carefully the need for units involving fewer than five dollars worth of parts.

The following list of typical units will give the designer an idea of how far to subdivide this equipment into individual units:

Transmitter:

- R. F. Section
- Modulator
- Modulation Limiter

Speech Input Equipment
 Pre-Amplifiers
 Mixer
 Booster Amplifier
 Master Control Equipment
 Booster Amplifiers
 Channel Amplifiers
 Monitor Amplifier
 Line Terminating Equipment
 Patch Panel
 Equalizers

BIBLIOGRAPHY OF REFERENCES ON CARRIER CURRENT INTER-COMMUNICATION EQUIPMENT

Recently Vicent C. Oxley, Technical Manager of WVBR, Cornell, asked us for a list of references on carrier current type inter-communication systems, as he wished to build one. With the thought that there may be others also interested in this subject, the list of references is below:

- Inter - Office Communication: Electronics Engineering Manual, First Edition (published by Electronics Magazine)
 A Small Interphone: Radio Craft, April 1943
 Page 418
 R. F. Carrier Communications, Part II; Radio Craft, May, 1943, Page 475
 Carrier Communicator; Radio Craft, August 1943, Page 664
 Carrier Communicator: Radio Craft, April, 1945, Page 426
 Wired Radio Intercon: Radio News, April, 1945, Page 42.

David W. Borst.

MORITZ GOES TO HARVARD

Clem Moritz, of the IBS Technical Advisory Committee, is leaving his job with the Philco Corp. to attend Harvard Graduate School in the term starting September 20.

TECHNICAL BIBLIOGRAPHY

The reference bibliography of technical articles does not appear in this issue because of lack of space. It will be individually prepared and sent to all station technical personnel. A cumulative bibliography will be published in June and sent to all technical personnel.